REMARKS

The applicant respectfully requests reconsideration of claims 1-18 of this application.

I. The Status of All Claims

Claims 1-18 are pending. Claims 1-7 and 11-18 are amended. Claims 1 and 11-13 are the only independent claims. Claims 2-5 and 18 depend from claim 1, claims 7-10 depend from claim 6, and claims 14-17 depend from claim 12

The specification fully supports the changes to claims 1-7 and 11-18. Therefore, the applicant submits that no new matter has been added.

II. The Rejections of Claims 1-3, 5-8, 10-12, 14-15 and 17 under 35 U.S.C. 103(a) as being unpatentable over Ferguson (US 5,521,902) ("Ferguson"), in view of Christiansen et al. (US 6,075,855) ("Christiansen").

A. Claims 1 and 11

1. The Examiner's Assertions

The examiner asserts at page 3 line 1 to page 4 line 22 of the Office action mailed 3/22/2005 that:

> As to claims 1 and 11, Ferguson teaches a signalling apparatus for processing signalling messages, comprising a signaling point (a signaling point 20 as illustrated in Fig. 2); links via which the signalling point is connected to at least a second signaling apparatus (signaling point 20 with PC=8 connects to signaling point 20 with PC=9 via links 18A, 188 and 18C as illustrated in Fig. 2) (Ferguson, C4: L13-21); at least one signalling system within said signaling point (signaling point 20 with PC=8) that sends signalling messages to the second signaling apparatus or, respectively, receives signalling messages from the second signaling apparatus via said links (signalling point 20 with PC=8 sends/receives signalling messages to/from signalling point 20 with PC=9 via links 18A, 18B and 18C as in Fig. 2) (Ferguson, C4: L13-21); wherein said signaling system respectively allocates a signalling network identity to said links (for example, link

18A is uniquely identified or allocated by the triplet "8,9,1" link 18B as "9,8,2" ; etc.) (Ferguson, Fig. 2 and C4: L22-38). However, Ferguson does not explicitly teach at least one of said links is returned in a loop from the signaling point to the same signaling point as a loop link, wherein different signaling network identities are allocated to the loop link at an output and input side by the signaling system; and wherein said loop link comprises at least one of a network tunnel and a signaling tunnel. In a related art, Christiansen teaches a system and method of accessing a Service Control Point (SCP) in an ISUP network, wherein a link is returned in a loop from a signaling point to the same signaling point as a loop link (i.e., a loop-back trunk 6 has an outbound side and an inbound side with respect to MSC 4 as in Fig. 1), wherein different signaling network identities are allocated to the loop link at an output and input side by the signaling system (to MSC 4, loop-back trunk 6 appears as two independent trunks, each having a unique identification at the switch) and said loop link comprises at least one of a network tunnel and a signaling tunnel (i.e., MSC 4 controls outbound calls to SCP 7 on the outbound trunk of loop-back trunk 6 and SCP 7 controls inbound calls to MSC 4 on the inbound trunk of loop-back trunk 6) (Christiansen, C3: LI 3-65). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to combine the teachings of Ferguson and Christiansen to include at least one of said links is returned in a loop from the signaling point to the same signaling point as a loop link, wherein different signaling network identities are allocated to the loop link at an output and input side by the signaling system; and wherein said loop link comprises at least one of a network tunnel and a signaling tunnel since such methods were conventionally employed in the art to provide a method in an ISUP network that will allow a connection to an intermediate destination followed by a connection to a final destination without complete call tear down upon release of the intermediate circuit (i.e., the SCP) (Christiansen, C2: L24-31). [Office action mailed 3/22/2005 at page 3 line 1 to page 4 line 22.]

2. The Passages From Ferguson and Christiansen Relied Upon By the Examiner

In rejecting claims 1 and 11, the examiner relies upon the following passages from Ferguson at column 4 lines 13-38:

> FIG. 2 shows in more detail the general case of the connection of a monitor probe 21 to one link 18A of a link set 18 that extends between two signalling points 20 (for example, between the SCP 13 of FIG. 1 and one of the associated STPs). The link set 18 of FIG. 2 comprises three links, namely the monitored link 18A and two further links 18B and 18C. The signalling points 20 both identify these links 18A, B, C as the first, second, and third links (LINK=1, 2 or 3) between them.
>
> The signalling points 20 are themselves uniquely identified in the SS7 network 10 by point codes. In the FIG. 2 example, point codes 8 and 9 have been allotted to the signalling points 20 simply by way of illustration (in practice, each point code is specified by 14 bits).
>
> It will be appreciated that any individual link on the network can be uniquely identified by the triplet composed of:
>
> the point code of the signalling point at one end of the link;
>
> the point code of the signalling point at the other end of the link;
>
> the link number within the link set joining the signalling points.
>
> Thus, the link 18A is uniquely identified by the triplet (8, 9, 1). [Ferguson at column 4 lines 13-38.]

In rejecting claims 1 and 11, the examiner relies further upon the following passages from Christiansen at column 3 lines 13-65 in an attempt to overcome the admitted deficiencies of Ferguson:

> Cellular calling party 1 is connected to cell tower 2 over radio-telecommunications link 3. Cell tower 2 is connected to mobile switching center (MSC) 4 over multi-frequency (MF) trunk 5. MSC 4 generally includes a plurality of loop-back trunks, one of which is shown at 6. Loop-back trunk 6 has

an outbound side and an inbound side with respect to MSC 4. Loop-back trunk 6 is allocated to SCP 7. SCP 7 can be a suitable model of any of the commercially available SCPs. In practice, several loop-back trunks may be allocated to a SCP. Outbound ISUP signaling trunk 8 and inbound ISUP signaling trunk 9 connect MSC 4 and SCP 7 through SS7 network 10. These signaling trunks are associated with the outbound side and inbound side of loop-back trunk 6, respectively. SCP 7 includes enhanced services database 11.

MSC 4 is also connected to Interactive Voice Response Unit (IVRU) 12 over MF connection 13 through public switched telephone network (PSTN) 14. IVRU 12 can be a suitable model of any of the commercially available IVRUs. IVRU 12 is also connected to SCP 7 over TCP/IP link 15. MSC 4 is further connected to SSP 16 over voice trunk 17 and ISUP signaling trunk 18 through PSTN 14. PSTN 14 preferably includes SS7/ISUP signaling. SSP 16 is further connected to called party 19 over twisted pair connection 20. Although not explicitly shown, ISUP trunks 8, 9 and 18 and voice trunks 5, 13 and 17 may include network elements such as service switching points (SSP), tandem switches and signal transfer points (STP).

In the preferred embodiment of the invention, SCP 7 is modified to appear as a switch to other network elements of the SS7/ISUP network. ISUP is typically used as a call control protocol between switches that share voice trunk connections. Since SCP 7 is not a true switch and has no voice trunks, voice trunks are simulated by way of loopback trunks on other switches. On MSC 4, loop-back trunk 6 is configured by hard-wiring an outbound voice trunk to an inbound voice trunk, and routing the SS7 ISUP data messages associated with the outbound voice trunk to the SCP. In addition, ISUP signaling trunk 8 associated with the outbound voice trunk of loop-back trunk 6 and ISUP signaling trunk 9 associated with the inbound voice trunk of loop-back trunk 6 are both connected to SCP 7. Preferably, both ends of loop-back trunk 6 have the same circuit identification code (CIC), while a first signaling point code (SPC) is assigned to the SCP connection of outbound ISUP link 8, and a second SPC is assigned to the

SCP connection of inbound ISUP link 9. To MSC 4, loop-back trunk 6 appears as two independent trunks, each having a unique identification at the switch. In operation, MSC 4 controls outbound calls to SCP 7 on the outbound trunk of loop-back trunk 6, and SCP 7 controls inbound calls to MSC 4 on the inbound trunk of loop-back trunk 6. [Christiansen at column 3 lines 13-65.]

3. The Applicant's Reply

a. The Recitation of Claim 1

Claim 1, as presently amended, recites:

1. A signalling node for processing signalling messages, comprising:

(a) links via which the signalling node is connected to other signalling nodes;

(b) at least one signalling system that sends signalling messages to other signalling nodes or, respectively, receives signalling messages from said other signalling nodes via said links;

characterized by

(c) the signalling system respectively allocates a signalling network identity to a link;

(d) at least one link that is not connected to other signalling nodes but formed as a loop, what is referred to as a loop link,

whereby different signalling network identities are allocated to the loop link at an output and input side by the signalling system. [Emphasis added.]

b. The Applicant's Disclosure In Support of Claim 1

It is clear from the specification of this application that the claimed "...loop link..." connects networks internal to a node and requires only one physical link. The present invention uses a "signalling tunnel" in a novel way to achieve the claimed "...loop link...," as illustrated by the following passages from the specification of this application.

The specification of this application discloses at page 1 line 28 to page 3 line 25, for example, that:

> In ZGS7, a network is identified by what is referred to as a network indicator (NI) that is contained in the messages. 2 bits for the NI are reserved in the messages; up to four networks can thus been distinguished from one another

in a node (said networks can, for example, be a matter of the signalling networks of communication networks of different operators or different technologies (for example, broadband or narrowband) as well as a matter of national or, respectively, international signalling networks). Since a signalling link normally belongs to only one network, however, the perception has prevailed that allocating individual links to specific networks suffices for distinguishing the network. The NI is thus no longer required as a distinguishing feature.

In fact, there are communication systems that support more than four signalling networks (for example, 8 or 32), for example the EWSD system of Siemens AG, or such systems are being planned. A network identity is thereby internally allocated to each signalling link and an NI is externally allocated to each internal network identity. Networks with different internal identity can thereby definitely use the same external NI. Each (internal) network is thereby completely separated from the other networks.

This concept, what is referred to as the multiple network concept, is then employed for operating loops in ZGS7 without requiring additional development. The signalling system in a signalling point is identified in two (internal) networks by different point codes. These two networks can then be unproblematically connected to one another by signalling links. When a check of the incoming NI for correctness is implemented in the system or, respectively, in at least one of the two networks to be interworked with one another, then the same external NI must also be allocated to the two internal networks. Note: when there is no mapping of incoming linkset onto NI and different networks must be monitored by a single, shared network entity (protocol realization), the NI therefor must be taken to identify the "responsible" network (the applicable routing table). Without a check, for example, it is thereby possible that a message from one network is illegally forwarded into another network due to the employment of an incorrect NI, which can lead to disadvantageous behavior in the other network (this could be referred to as uncontrolled tunneling since it is externally triggered and can no longer be controlled in the node).

Said arrangement is referred to below as network or, respectively, signalling tunnel. Embodiments of the invention are explained in greater detail below.

Figure 1 shows an embodiment of the invention for the interworking in a signalling point. An ISUP is located both in the internal network 1 as well as 2. Externally, the two networks use the same NJ but different point codes. *A call between RI and R2 is routed via the ISUP loop. It suffices for this purpose to correspondingly configure the ZGS7 routing tables in both networks as well as the routing tables for 10 the call processing (RI and R2 in ISUP) and to accomplish [sic] the necessary trunks and signalling tunnels for the ISUP loop.*

An interworking is realized between CCITT signalling system RI and ISUP as well as between CCITT signalling system R2 and ISUP but not between RI and R2. *A call that is supposed to run from R1 to R2 is first handed over outgoing to the ISUP by the call processing, said ISUP routing the MSU belonging to this connection setup via the signalling tunnel to the ISUP of the other network.* Coming from RI, thus, the call is thus first handed over to the ISUP in network 1. Using the called party address signalled by R1, the ISUP determines the next destination with the appertaining DPC (DPC=9), enters this DPC into the MSUs and then hands over these MSUs to the MTP of ZGS7. *The MTP takes the DPC from the MSUs and, on the basis of its routing table for network 1, determines the link (a loop link) therefrom via which it further-routes the MSU.* The ISUP in network 2 receives the MSUs from the MTP and in turn hands over the MSUs and, thus, the call to the call processing. On the basis of its routing table, the call processing then determines that the call is forwarded via R2. [Specification at page 1 line 28 to page 3 line 25.]

It would be clear from the specification of this application, to one of ordinary skill in the art, that the claimed "loop link" uses only a single physical link. The specification of this application discloses that the claimed "loop link" of the present invention is implemented using network tunnels within a single node, not separate physical links between different nodes.

c. The Combination of Ferguson With Christiansen Does Not Disclose or Suggest a "loop link" as Recited in Claim 1

Christiansen (column 2, lines 33-44) discloses a method that allows a connection to an intermediate destination through a SCP, followed by a release of only those circuit segments from the intermediate destination to the SCP, followed by establishing a new connection from the SCP to a final destination, which is an extension of the remaining segments of the original connection. To realize this method,Christiansen utilizes the ISUP loop-back trunk technique as described in Wegner et al (U.S. Pat. No. 5,377,186).

This loop-back trunk technique is used to forward a call from a switch over a SCP back to the switch in order to get translated destination numbers for the call. This loop-back trunk technique utilizes two physically different trunks (outbound link and inbound link) from a MSC to a SCP. In contrast, claim 1 defines a "...link that is not connected to other signalling nodes but formed as a loop, what is referred to as a loop link..." One of ordinary skill in the art would recognize that Christiansen's "MSC" and "SCP" are each separate signaling nodes. Therefore Christiansen's teachings are specifically excluded by the recitation of claim 1 because Christiansen's "MSC" and "SCP" are connected. Christiansen's disclosure cannot be equivalent to the claimed "loop link," which requires only a single physical link to implement the claimed "loop link" internally within a single node.

Therefore, the applicant respectfully submits that Christiansen in combination with Ferguson does not teach or suggest all the elements recited in claim 1. Therefore, the applicant respectfully submits that the examiner has not made out a proper *prima facie* case of obviousness. Therefore, the applicant respectfully submits that the rejection of claim 1 under 35 USC 103(a) is improper and should be withdrawn.

B. Claim 2

1. The Examiner's Assertions

The examiner asserts at page 4 line 22 to page 5 line 2 of the Office action mailed 3/22/2005 that:

> As to claim 2, Ferguson-Christiansen teaches the signalling apparatus of claim 1, wherein said signalling system, with assistance of said loop link

communicates signalling messages between two signaling systems contained in the signaling point (Ferguson, C2: L44-45 and Christiansen, C3: L34-41). [Office action mailed 3/22/2005 at page 4 line 22 to page 5 line 2.]

In rejecting claim 2, the examiner relies upon the following additional brief passage from Ferguson at column 2 lines 44-45: "...interface means for interfacing the apparatus to an SS7 signalling link....." Ferguson at column 2 lines 44-45.

In reply the applicant repectfully submits that claim is not obvious under 35 USC 103(a) for at least the same reasons given above for independent claim 1 from which claim 2 depends. Therefore, the applicant respectfully submits that the rejection of claim 2 under 35 USC 103(a) is improper and should be withdrawn.

C. **Claim 3**

The examiner asserts at page 5 lines 3-6 of the Office action mailed 3/22/2005 that: As to claim 3, Ferguson-Christiansen teaches the signalling apparatus of claim 1, wherein said signalling system generates internal load for test purposes (i.e., signalling link test messages are generated for test purposes) with assistance of said loop link (Ferguson, C5: L4-15). [Office action mailed 3/22/2005 at page 5 lines 3-6.]

In rejecting claim 3, the examiner relies upon the following additional passage from Ferguson at column 5 lines 4-15:

> In other words, for most SS7 message types, the monitor probe 21 cannot, by reading the routing label of messages on the link it is monitoring, ascertain the absolute identity of that link. However, for one message type, namely signalling link test messages, the source and destination point codes in the routing label of the message do indeed indicate the signalling points at opposite ends of the link on which the message is monitored. Furthermore, for such signalling link test messages, the SLS field of the routing label actually contains the link number of

the link carrying the message as between that link and any other links in the same link set.

The monitor probe 21 may therefore ascertain the absolute identity of the link it is monitoring by detecting signalling link test messages on the link and reading off the routing label of such messages. [Ferguson at column 5 lines 4-15.]

In reply the applicant repectfully submits that claim 3 is not obvious under 35 USC 103(a) for at least the same reasons given above for independent claim 1 from which claim 3 depends. Therefore, the applicant respectfully submits that the rejection of claim 3 under 35 USC 103(a) is improper and should be withdrawn.

D. **Claim 5**

The examiner asserts at page 5 lines 7-11 of the Office action mailed 3/22/2005 that:

As to claim 5, Ferguson-Christiansen teaches the signalling apparatus of claim 1, wherein said signalling system is a signalling system according to No. 7 (i.e., SS7/ISUP network of Fig, 1) and allocates a same network identifier to said loop link at the output and input side (preferably, both ends of loop-back trunk 6 have the same circuit identification code CIC) (Christiansen, C3: L55-57). [Office action mailed 3/22/2005 at page 5 lines 7-12.]

In reply the applicant repectfully submits that claim 5 is not obvious under 35 USC 103(a) for at least the same reasons given above for independent claim 1 from which claim 5 depends. Therefore, the applicant respectfully submits that the rejection of claim 5 under 35 USC 103(a) is improper and should be withdrawn.

E. **Claims 6-8 and 10**

The examiner asserts at page 5 lines 13-14 of the Office action mailed 3/22/2005 that:

Claims 6-8 and 10 are corresponding method claims of apparatus claims 1-3 and 5; therefore, they are rejected under the same rationale. [Office action mailed 3/22/2005 at page 5 lines 13-14.]

In reply the applicant repectfully submits that independent claim 6 recites a "...loop link...." Therefore, the applicant repectfully submits that independent claim 6 is not obvious under 35 USC 103(a) for at least the same reasons given above for independent claim 1. Therefore, the applicant respectfully submits that the rejections of claim 6, and dependent claims 7, 8, and 10 under 35 USC 103(a) are improper and should be withdrawn.

F. **Claim 12**

The examiner asserts at page 5 lines 15-22 of the Office action mailed 3/22/2005 that:

> As to claim 12, Ferguson-Christiansen teaches the signaling apparatus of claim 1, with the addition of at least one routing table configured with at least one of said first unique network identity and said second unique network identity (the local switch reserves an outgoing voice trunk to the intermediate exchange based on a routing table entry associated with the dialed number) (Christiansen, C4: L7-21). [Office action mailed 3/22/2005 at page 5 lines 15-22.]

In rejecting claim 12, the examiner relies upon the following additional passage from Christiansen at column 4 lines 7-21:

> After the calling party has dialed, the local switch reserves an outgoing voice trunk to the intermediate exchange based on a routing table entry associated with the dialed number. The local switch then sends an Initial Address Message (IAM) over a signaling trunk to the intermediate exchange requesting a connection be established over the reserved voice trunk.
>
> The intermediate exchange then reserves an outgoing voice trunk to the destination exchange based on a routing table entry associated with the dialed number in the IAM received from the local exchange. The intermediate exchange then sends an IAM over a signaling trunk to the destination exchange requesting a connection be established over this reserved voice trunk. [Christiansen at column 4 lines 7-21.]

In reply the applicant repectfully submits that independent claim 12 recites a "...loop link...." Therefore, the applicant repectfully submits that independent claim 12 is not obvious under 35 USC 103(a) for at least the same reasons given above for independent claim 1. Therefore, the applicant respectfully submits that the rejection of claim 12 under 35 USC 103(a) is improper and should be withdrawn.

G. **Claims 14, 15, and 17**

The examiner asserts at page 6 lines 1-2 of the Office action mailed 3/22/2005 that:

Claims 14-15 and 17 are corresponding apparatus claims of claims 2-3 and 5; there lines fore, they are rejected under the same rationale. [Office action mailed 3/22/2005 at page 6 lines 1-2.]

In reply the applicant repectfully submits that independent claim 12 recites a "...loop link...." Therefore, the applicant repectfully submits that dependent claims 14, 15, and 17 are not obvious under 35 USC 103(a) for at least the same reasons given above for independent claim 12. Therefore, the applicant respectfully submits that the rejections of dependent claims 7, 8, and 10 under 35 USC 103(a) are improper and should be withdrawn.

III. The Rejections of Claims 4, 9, 16, and 18 Under 35 USC 102(b) as Being Anticipated by United States Patent 5,521,902 to Ferguson ("Ferguson")

A. **Claims 4, 9, and 16**

The examiner asserts at page 6 lines 7-20 of the Office action mailed 3/22/2005 that:

As to claim 4, 9 and 16, Ferguson teaches the signalling apparatus of claim 1, but does not explicitly teach said signalling system realizes an interworking communication with other networks with assistance of a said loop link. However, as well known in the art that in SS7 networks, Service Switching Points "SSPs" 11 and Service Transfer Parts "STPs" 14 were conventionally employed and allocated in different networks. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made

to modify the teaching of Ferguson to utilize the assistance of a loop link at the SSPs and STPs in different networks to achieve an interworking communication with other networks because such Signal Transfer Points "STPs" (which are multi-port, high-speed packet switches that are programmed to respond to the routing information and route a packet to its destination) were conventionally employed in the art to interconnect between networks via a SS7 data link. [Office action mailed 3/22/2005 at page 6 lines 7-20.]

In reply the applicant repectfully submits that dependent claims 14, 15, and 17 are not anticipated by Ferguson under 35 USC 102(b) because claims 14, 15, and 17 depend from independent claims 1, 6, and 12, respectively. Each of independent claims 1, 6, and 12 recites a "...loop link...." Ferguson does not disclose a "...loop link...." for the reasons given above for claim 1. Therefore, Ferguson does not disclose all the limitations recited by the base claims from which claims 14, 15, and 17 depend. Therefore, the applicant respectfully submits that the rejections of dependent claims 14, 15, and 17 under 35 USC 102(b) are improper and should be withdrawn.

B. **Claim 18**

The examiner asserts at page 7 lines 1-6 of the Office action mailed 3/22/2005 that:

> As to claim 18, Ferguson teaches the signaling apparatus of claim 1, further comprising at least a second signaling system within said signaling point (as well known in the art that each of the network nodes, i.e., a signaling point, may include control units and storage units, wherein each control unit may include: microprocessors, microcontrollers, processor cards, computer systems and other control or computing devices to provide various processing and storage capabilities). [Office action mailed 3/22/2005 at page 7 lines 1-6.]

In reply the applicant repectfully submits that claim 18 is not obvious under 35 USC 103(a) for at least the same reasons given above for independent claim 12 from which claim 18

depends. Therefore, the applicant respectfully submits that the rejection of claim 18 under 35 USC 103(a) is improper and should be withdrawn.

IV. The Rejections of Claim 13 Under 35 USC 102(e) as Being Anticipated by United States Patent 6,584,190 to Bressler ("Bressler")

The examiner rejects claim 13 at page 8 lines 3-14 of the Office action mailed 3/22/2005 as being anticipated by Bressler, stating that:

> As to claim 13, Bressler teaches a telephony communications system comprising:
>
> allocating unique point codes to each of a plurality of signalling networks interconnecting a plurality of signalling points (*each network node or signalling point, SSP 20, STP 22 or STP 24 of Fig. 2 is assigned a unique point code*); and
>
> routing a signal from a first network of said plurality of signalling networks to a second network of said plurality of signalling networks using said unique point codes (*numeric point codes are carried in control signalling messages exchanged between network nodes to identify the source and destination of each message and based on the point codes, an STP 22 accesses a routing table to select the appropriate signalling path for routing each message*) (Bressler, C5: L45-62). [Office action mailed 3/22/2005 at page 8 lines 3-14.]

In reply the applicant repectfully submits that dependent claims 13 are not anticipated by Bressler under 35 USC 102(e) because claims 13 depend from independent claim 12. Independent claim 12 recites a "...loop link...." Bressler does not disclose a "...loop link...." Therefore, Bressler does not disclose all the limitations recited by the base claim from which claim 13 depends. Therefore, the applicant respectfully submits that the rejection of dependent claim 13 under 35 USC 102(e) are improper and should be withdrawn.

V. **Closure**

Should the examiner have any questions, he is urged to contact the undersigned at 703-415-0012.

Respectfully Submitted,

7/21/2005 Robert G. Crockett

Date

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Printed: July 21, 2005 (4:45pm)
Y:\Clients\Siemens\SIEM0015UUS\Drafts\Amendment_050701.wpd